

TRADITIONAL BUILDING ADAPTATION TO NEW REQUIREMENTS: HISTORIC

CENTER OF AREQUIPA, PERÚ

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INTRODUCTION

The traditional buildings in the historic center of the city of Arequipa, Perú, recently declared of human heritage, are of volcanic tuff both in walls and in vaulted roofs on the ground floor. Having been built in the 18th century and up to the beginning of the 20th century, they have suffered many damages from the seismic movements registered in this region. Due to this, many of them have had to be rebuilt. In this presentation, the different changes to adapt the city of Spanish colonial origin to the present tertiary use are analyzed.

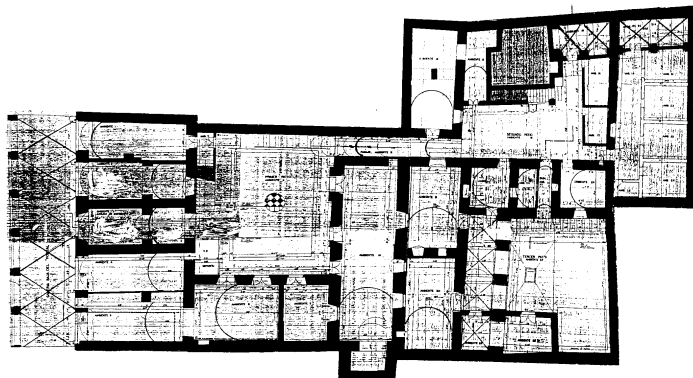
INTERVENTIONS

Three different types of interventions performed on these old dwellings, which in turn, affect the restoration, rehabilitation or adaptation works can be distinguished. Interventions can be of *urban* importance: due to the interior courtyard extroversion, the façade transformation, the building height increase, the color variety, etc. A second type of interventions is of *architectural* nature: due to the changes in use derived from the different floors, the introduction of service areas or fittings and the disappearance of gardens and vegetable gardens. The third type is the *structural* intervention, due to the strengthening of the vaulted structures against seismic damages.

Interior courtyard extroversion

One of the changes is the street image transformation, from a grid patterned corridor to commercial streets, physically and visually extended into the house courtyards, and presently converted into museums, banks, hostels or commercial centers. Having the two gate doors open, the courtyard is reached easily through an entrance hall, a space which can be a prolongation of either the courtyard or the street. This action, even in the listed dwellings, has originated the extroversion of the first courtyard in the noble houses, and of the only existing courtyard in lower category houses.

Fig. 1 Alferez Flórez house plan with three courtyards, located at the main square.



Courtyards have lost their private atmosphere character to become part of the urban landscape in the historic center, forming a continuous space street-hall-courtyard. They have been transformed into public circulation areas, cafeteria terraces, recreational places for schools or colleges, or commercial stands as in the case of the Alferez Flórez 's courtyard (Fig.1).

Changes in façades

An old and frequent intervention done has been to open or close the façade openings altering the central door configuration with windows at its sides. One of the most documented examples before its restoration, was the two-window conversion into a door performed in the noble house of Tristán del Pozo built in 1736, when it was used as a commercial premise. One of the characteristics of these noble houses is the carved stone façades.

The vast majority of doors conserve the doorpost of the preexisting window whenever possible, maintaining the horizontal or curved lintel. This operation has produced a loss of dozens of iron grilles, one of the most characteristic ornamental elements of the façades in Arequipa.

On the other hand, apart from the commercial activity, a continuous perforation of the enclosure has been developed, as well as the house subdivision, and the entrances to the new floors. One should consider also, the windows and doors greater proportions in the new buildings, constructed in great number in the historic center during the eighties to show the modernity in relation to the surrounding buildings. To a lesser extend openings have been walled up.

The façade disfiguration is another aspect of the abandonment. Figure 2 shows the present façade of the “tambo” (a public lodging of the colonial period) of La Cabezona, and the hypothetical original state. Some existing recycled balustrades can be noticed, which are inserted in the door opening, although the original ones, which supported the bracket of the balconies, have disappeared.

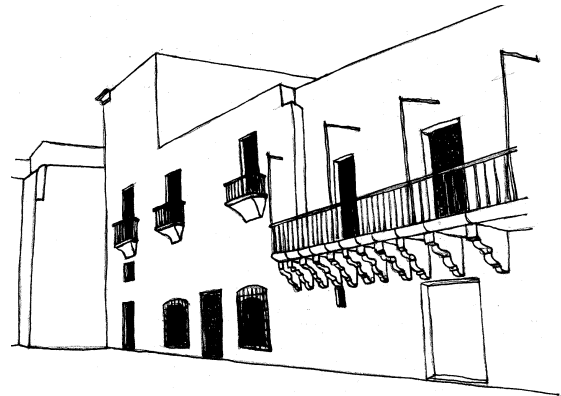


Fig. 2. Tambo de La Cabezona. See in photograph present state and in the drawing the possible original state.

Ground floor constructions

During the first half of the 19th century, coinciding with the independent movement from the Spanish crown, the neoclassic style was introduced in façades with grooved columns, ionic capitals and wide cornices, which serve as support for the balconies. The upper constructions were much lighter, with a timber framework erected over the ground floor roofed with barrel vaults. They used metal sheet roofing, stretcher tuff stone walls, and metal beam slabs with jack arch blocks made of the same stone. The building evolution of a

dwelling is shown in figure 3, with the addition of the first floor and the conversion of one of the original ground floor window into a door (Fig. 3 House in Jerusalén Street #204).



Fig. 3. Façade with two different age floors and left window converted into door.

Other didactic examples show the slow growth of the city. Through the years, since the local premises built in 1796 changed ownership, one of the owners built this first floor destroying the original cornice of the bay. (Fig. 4 Buildings on San Agustín Street 101-113).

It is from the beginning of the 20th century after the earthquakes of 1958 and 1960 when a renovation of the upper floors begins. Two floors as well as a third one a little set back were built introducing reinforced concrete in these buildings of a greater height. These enlargements altered also the street height-length relationship up to the cornice level.

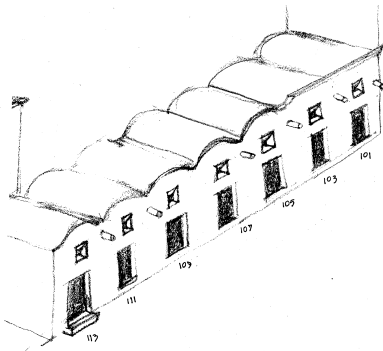


Fig. 4 Commercial premises of St. Agustín Street. In drawing previous stage, and in photograph first floor over one of them.



Vault reinforcement

The thick stone and concrete wall, and the disposition of vaults and countervaults, as can be seen in Fig. 1, work on the mutual counteracting thrust forces including the neighboring buildings, since there are no separating spaces. In spite of all these characteristics, the earthquakes produced during the 19th and 20th centuries destroyed a great number of vaults that are still being damaged with the seismic movements. For this reason, in order to increase the existing vaults stability and the user's security, one of the most common interventions --not seen from the exterior-- consists in the introduction of reinforced concrete tie beams at the wall heads or the construction of reinforced concrete metal sheeting over the vault extrados, finished with a brick tile cladding.

Arched closures and new mezzanines

In the old arbor of the noble houses, situated on the second or third floors and covered with groin vault, the archways have been glazing so as to provide a greater area either for housing needs or for services. Taking advantage of the height of 4.75m approximately from floor to vault keystone in the intrados, several timber framed mezzanines have been constructed, increasing the useful area (fig. 5 Section in the Bronze tambo). In the dwellings, this space is adapted for bedrooms and in the commercial buildings for offices; some of the mezzanines take advantage of the natural light coming from the existing upper windows.

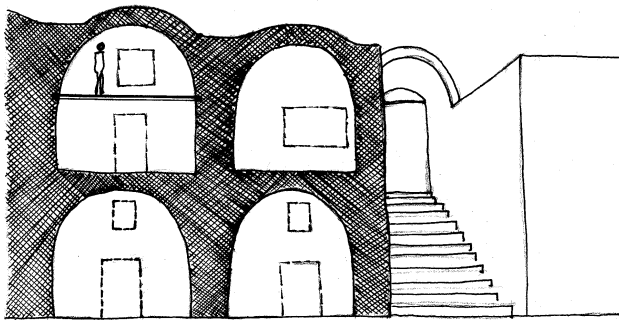


Fig. 5. Section of Tambo de Bronze. See in photograph a room attached to the façade.



Improvement of the mixed walls

One of the changes was produced with the introduction of the bathrooms, once drinkable water reached the homes in late 19th century. For installing them, the empty areas were used, the wall niches were enlarged or the built-in arches, where old cooker or larders were located, were recycled. Nevertheless, new openings were done eliminating one of the sides of stretcher stonework and the concrete core, leaving only the other side also as stretcher bond. By doing this, space for the sanitary fittings was gained (Fig. 6, house en Cruz Verde Street # 423, bathtub in an old built-in arch used as a cooker conserving still the fireplace holes).

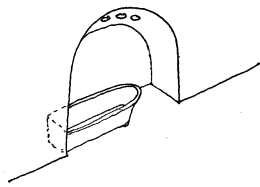


Fig. 6. See in photograph the wedgestones of the old built-in arch where the bathtub has been introduced.

Material and constructive elements recycling

The demolitions due to new constructions are always a source of materials and architectural elements, which are otherwise not recycled. The stone blocks are used in new constructions built in the city periphery, the brackets for new balconies and the iron grilles for new windows or as melting material.

Courtyard and garden paving

The courtyards lack gardens due to the already commented causes. Located at the center, usually squared or circular, and with a perimetral fence to protect them, they had up to twelve plants cultivated in a 2m diameter approximately. They included scent plant such as the "huatacay", medicinal ones like the aloe or ornamental ones like the red geranium.

Due to the process of overpopulation and to increase the estate profitability, the vegetable gardens at the end of the premises have disappeared to give way to new constructions. This has produced a great environmental change in a city lacking green spaces.

Material preservation

The city, during the 18th century was lime whitewashed and from the 19th century on the stonework was painted in indigo blue, red and yellow. The stone blocks were of 40 x 40 x 20 cm, measurements derived from the colonial measurement system. Later they developed into 40 x 30 x 20 cm and 60 x 30 x 20 cm, adapting in a better way to the construction of walls in a stretcher and header bond.

In the 20th century, two forms of façade treatment have been included. From the 70's on, the original material, both in exteriors and interiors have been discovered, eliminating whitewashing and plastering which hid the white stone beauty with black and brown inlays. On the other hand, following the same trend of using the original material, small pieces of 25 x 15 x 2 cm of volcanic stone have been introduced to clad the new parts of the buildings. In the old constructions the restorations favored one of the two possibilities: to maintain the nude stone or to recuperate the traditional colors. It is obvious, however, the effort in preserving the use of the old material even if it is only in the closure walls.

CONCLUSIONS

The change of the constructions, from housing to services has originated the predominant practical character of the interventions. In order to adapt the buildings to the new

requirements, the façade artistic value has partially been lost. The loss of the façade symmetry giving way to new opening and windows has also been a fact.

The floor demand originates the disappearance of the sequence entrance hall-interior courtyard, both being joined into one space and in turn, annexed to the street.

The conservation of the thick walls is guaranteed because of the vaulted roofs covering them. If they were not there they could run the risk of disappearing because they would lose their function of counteracting the thrusts produced by the vaults.

On the other hand, the uninterrupted use of the volcanic stone and the traditional stonework techniques does not simplify the intervention distinctions, more so in the old age layers of the façade. The presence of new materials, especially the use of grey glazing without frames shows the modernity of the interventions.

One reason in favor is that of all these interventions on the built heritage do not destroy it, but on the contrary, architecture of pre-existences is built up. Finally, a great number of works made by the private owner is solving the lack of commercial infrastructure and services in the historic center, without expense cost for the State or Town Council.